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NOTES ON THE FLORA OF WESTERN NOVA SCOTIA 1921.

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(Continued from page 164.)

***JUNCUS EFFUSUS* L., var. *CONGLOMERATUS* (L.) Engelm. See Fernald & Wiegand, *RHODORA*, xii. 85 (1910). Locally abundant in peaty soil, Shelburne. The old record from Nova Scotia was based on young and unidentifiable material.

J. EFFUSUS, var. *PYLAEI* (Laharpe) Fernald & Wiegand. HANTS Co.: swales near Uniacke Lake.

J. SUBCAUDATUS (Engelm.) Coville & Blake, var. *PLANISEPALUS* Fernald, *RHODORA*, xxiii. 241 (1922). Many new stations east to Hants and Halifax Cos.

J. MILITARIS Bigel. The commonest form of *J. militaris* has, as described by Bigelow, the "Culm . . . with a long sheath or two at base, and commonly another above the leaf. Leaf cylindrical, erect, . . . inserted below the middle of the culm, and exceeding it in height,"¹ and tradition, as recorded in the herbarium of the late T. O. Fuller, tells us that "Bigelow named this *militaris* because it reminded him of a soldier carrying his bayonet above his head." So general is this combination of characters, the very tall and erect leaf and above it the firm bladeless sheath, that they have been treated as diagnostic. Thus, in the *Pflanzenreich*, Buchenau distinguishes *J. militaris* from related species by "Folium frondosum unicum, ca. in medium caulem insertum, strictum, crassum, unitubulosum, pungens, usque 100 cm. longum,"² while the key-character used in the 7th edition of Gray's *Manual* is: "Upper cauline leaves

¹ Bigelow, Fl. Bost. ed. 2: 139 (1824).

² Buchenau in Engler, Pflanzenr. iv. pt. 36: 173 (1906).

bladeless (or essentially so), consisting of firm tawny or colored sheaths 2.5–5 cm. long," etc.¹

On the border of Nowland Lake in Havelock, Digby County, Nova Scotia, occurs a plant with technical characters (perianths, seeds, etc.) of *Juncus militaris* but differing conspicuously from the typical form of the species in having two well developed cauline leaves, the upper with the sheath much less chartaceous than usual and terminated by a green blade two to four times its length; and in the large accumulation of material in the Gray Herbarium and the herbarium of the New England Botanical Club there are 2 similar specimens from Cape Cod and 1 from southern Connecticut. After finding the Nowland Lake plant with two frondose leaves, Mr. Long and I watched the species carefully, and, although discovering no more of the Nowland Lake form, found that there are occasional colonies with the ordinary submedian erect leaf but quite lacking the firm bladeless sheath above. Sometimes large colonies of this form are uniform, sometimes it occurs with typical *J. militaris*.

In the material at hand, 125 collections show the typical form of *J. militaris* with one long leaf-blade and above it a large colored bladeless or nearly bladeless sheath; 4 collections have two well developed leaves and 21 a single long leaf without the large bladeless sheath above. The latter form, occurring as it does often intermixed with the typical plant, is a minor variation but the other seems to be a well pronounced form and it will facilitate reference to both these extremes if they are designated

****J. MILITARIS** Bigel., forma **subnudus**, n. f., folio frondoso 1, folio secundo hypsophyllino nullo.—Occasional through the range of the typical form. TYPE: peaty border of a small pond, Upper Cornwall, Lunenburg Co., Nova Scotia, August 17, 1921, *Fernald & Long*, no. 23,627 (Gray Herb.).

****J. MILITARIS**, forma **bifrons**, n. f., foliis frondosis 2, folio hypsophyllino nullo.—Infrequent through the range of the species. NOVA SCOTIA: forming subcespitose clumps, sandy and gravelly beach of Nowland Lake, Havelock, August 9, 1921, *Fernald & Long*, no. 23,626 (TYPE in Gray Herb.), August 27 (*Pl. Exsicc. Gray.*). MASSACHUSETTS: shore of pond, Eastham, July 13, 1907, *F. S. Collins*, no. 297; Dennis Pond, Yarmouth, July 18, 1907, *E. W. Sinnott*. CONNECTICUT: West Pond, Guilford, August 15, 1912, *A. E. Blewitt*, no. 1270.

J. NODOSUS L. Swales near Wentworth gypsum quarries, Windsor.

J. ACUMINATUS Michx. New stations eastward to Annapolis and Lunenburg Cos.

¹ Robinson & Fernald in Gray, Man. ed. 7: 269 (1908).

J. MARGINATUS Rostk. New stations eastward to Annapolis and eastern Shelburne Cos.

LOPHIOLA AMERICANA (Pursh) Wood. *L. septentrionalis* Fernald, *RHODORA*, xxiii. 243 (1922). LUNENBURG Co.: sphagnous boggy swale bordering Fancy Lake, near Conquerall.

At this station the large, freely stoloniferous and subcespitose plants at the quaking margin of the lake are strikingly similar to the original *L. septentrionalis* from Digby Neck; but farther back, on drier knolls, the plants are small, with solitary stems, short pedicels and denser lanate tomentum, quite like the typical plant of New Jersey. Study of this material shows that the seed- and capsule-characters, which were exhibited by the Digby Neck material, break down, and that *L. septentrionalis* is not specifically separable from *L. americana* of the New Jersey pine barrens.

***SISYRINCHIUM INTERMEDIUM* Bicknell. Various colonies seem to belong to *S. intermedium*. The plants are all sterile and there still remains doubt as to whether *S. intermedium* is a true species. Our collections are from YARMOUTH Co.: border of spruce swamp, Markland (Cape Forchu); dry fields and clearings near St. John (Wilson) Lake. ANNAPOLIS Co.: thin open humus on North Mt., Belle Isle.

S. ATLANTICUM Bicknell. Eastward to Annapolis and Lunenburg Cos.

HABENARIA FLAVA (L.) Spreng. Several new stations, all in the valley of the Tusket, Yarmouth Co., north to Parr Lake and east to Canoe Lake.

H. OBTUSATA (Pursh) Richardson. Very rare in the western Counties. ANNAPOLIS Co.: mossy woods, North Mt., Belle Isle. YARMOUTH Co.: mossy spruce woods, Greenville.

H. MACROPHYLLA Goldie. DIGBY Co.: old mixed woods near Cedar Lake, New Tusket.

SPIRANTHES CERNUA (L.) Richard, var. *OCHROLEUCA* (Rydb.) Ames. Characteristic of the dryest of siliceous barrens. Additional stations are, for YARMOUTH Co.: gravelly railroad-bank, Belleville. SHELburne Co.: abundant on dry sandy *Corema*-heath, Hope's Lot Barrens, Clyde River; common on dry sandy *Corema*-barrens north of Jordan Falls.

Salix viminalis L. Naturalized in roadside thicket, Hassett, Digby Co.

OSTRYA VIRGINIANA (Mill.) K. Koch. YARMOUTH Co.: wooded shore of Parr Lake; tree with remarkably coriaceous foliage.

THE VARIETIES OF *BETULA LUTEA*.—In 1904 Dr. Britton, by describing *Betula alleghaniensis*,¹ called attention to the fact that we have two fairly marked trends of the Yellow Birch which had hither-

¹ Britton, Bull. Torr. Bot. Cl. xxxi. 166 (1904).

to passed as *B. lutea* Michx. f. *B. alleghaniensis*, based primarily upon material from the upper slopes of Mt. Pisgah, western North Carolina, distributed by the Biltmore Herbarium as no. 1619, was given a broad range: "From Massachusetts to Quebec and northern Michigan, south to southern New York, Pennsylvania, and in the mountains to Georgia." Subsequently, in his *North American Trees* (1908), Britton made more definite his differentiation of the two Yellow Birches by stating the key-characters (p. 247):

Fruiting scales 4 to 5 mm. long; leaves mostly cordate

14. *B. alleghaniensis*.
Fruiting scales 8 to 10 mm. long . . . ; leaves rarely cordate
15. *B. lutea*.

On pp. 258 and 259 of the same work, where the two are more fully described and illustrated, *B. alleghaniensis* is shown with the leaves very definitely *not* cordate, with scales there described as "4 to 6 mm. long" and having "the wedge-shaped part below the lobes very short" and the fruits cuneate-obovate; while *B. lutea*, assigned a more northern range, has the scales with prolonged "stalk-like part below the lobes" and the fruits suborbicular. Though recognizing the two extremes indicated by Dr. Britton, various other students of our trees have subsequently been unable to keep them apart as species. Thus, in 1918 Ashe recognized the extreme with short scales as *B. lutea*, var. *alleghaniensis* (Britton) Ashe,¹ and more recently I have so designated² much of the comon Yellow Birch of Nova Scotia. Subsequently, in an attempt to label properly the material in the Gray Herbarium and the herbarium of the New England Botanical Club, I have carefully studied the specimens, with the result that it seems possible to recognize two strong trends in the scales. The leaves do not show the difference indicated in the key-characters above quoted and, as already noted, Dr. Britton's own illustration of *B. alleghaniensis* shows no approach to cordate leaves. Neither does the difference of fruit brought out in his illustrations regularly accompany the differences in the scales. But in general the scales which are only 5-8 mm. long (I have been unable to find any mature scales as short as 4 mm. and the material in the Gray Herbarium of Biltmore Herb. no. 1619, the type-number of *B. alleghaniensis*, has the scales 7-8 mm. long) and with short (mostly 1-2 mm.) base are of firm or subcoriaceous texture; while the scales of the other extreme,

¹ Ashe, Bull. Charleston Mus. xiv. 11 (1918).

² Fernald, RHODORA, xxiii. 257 (1922).

8–13 mm. long and with prolonged base, are subfoliaceous and sometimes even subsquarrose.

The latter is the tree taken by Dr. Britton to be *B. lutea*, but when Michaux's original description and plate are examined it at once becomes clear that the original *B. lutea* Michx. f.¹ was identical with *B. alleghaniensis*, i. e. the common Yellow Birch with short and subcoriaceous short-based scales which "abonde surtout dans les forêts de la Nouvelle-Ecosse, de la Nouvelle-Brunswick, du district du Maine, où elle est désignée sous le seul nom de *Yellow birch*, *Bouleau jaune*." This is indicated not alone by the very characteristic drawing of the fruiting ament and scale but by Michaux's definite statement (pp. 153, 154) that "les écailles . . . sont trifides, très-acuminées, et longues d'environ 3 lignes (7 millimètres)." That this extreme of the species is more common in the forests of Nova Scotia, New Brunswick and Maine than is the tree with longer and subfoliaceous scales is clear from the representation of the two in the herbaria (including that of the Arnold Arboretum) at hand. Of typical *B. lutea* (*B. alleghaniensis*) Nova Scotia shows a representation of 7 collections, New Brunswick 3, and Maine 21; while of the tree with long subfoliaceous scales Nova Scotia shows 3 collections, New Brunswick 1 and Maine 3.

Although it has been implied that the long-scaled extreme is of more northern range than the short-scaled typical *Betula lutea* (*B. alleghaniensis*) it is noteworthy that the collections at hand show the latter to be more generally collected in the cooler or more northern regions. The figures just listed are to the point; likewise the fact that our only collections from Quebec are of typical *B. lutea* as are 6 out of 8 from Vermont and 6 out of 9 from New Hampshire. Furthermore, the collections from the southern Alleghanies show the typical short-scaled *B. lutea* from an altitude of 3400 feet on the Blue Ridge of Virginia, from "Upper slopes of Mt. Pisgah," North Carolina (type of *B. alleghaniensis*) and from 6000 feet on the Great Smoky Mountains; while the southern material of the long-scaled extreme is from "along the East Fork of the Greenbrier River," West Virginia, "ex regione inferiori Montium Alleghany, Doe River Valley, Tennessee", from "near foot of Thunderhead Mt., E. Tenn," and common below 4000 feet in the mountains of Macon County, North Carolina. The collections from Indiana are, likewise, consistent with these ranges,

¹ F. André-Michaux, Hist. des Arbres Forest. de l'Am. Sept. ii. 152, t. 5 (1812).

2 numbers being the short-scaled tree, 7 the long-scaled. Fruiting specimens from Newfoundland and Labrador are wanting, but it is significant that nearly all material at hand from Connecticut (6 out of 7 collections), New York (9 out of 10) and Tennessee (2) are of the long-scaled extreme. Whatever factor may influence the distribution of the two it would seem that the typical short-scaled *B. lutea* cannot be regarded as generally of more southern range than the other.

To summarize, the two varieties of *Betula lutea* are:

BETULA LUTEA Michx. f. Hist. des Arbres Forest. de l'Am. Sept. ii. 152, t. 5 (1812). *B. excelsa* Pursh, Fl. Am. Sept. ii. 621 (1814), not Ait. *B. lenta*, α *genuina* Regel, Nouv. Mém. Soc. Nat. Mosc. xiii. 126, in part (1860). *B. lenta*, β *lutea* Regel in DC. Prodr. xvi. pt. 2: 179 (1868). *B. alleghaniensis* Britton, Bull. Torr. Bot. Cl. xxxi. 166 (1904), North Am. Trees, 257, fig. 216 (1908). *B. lutea alleghaniensis* (Britton) Ashe, Bull. Charlest. Mus. xiv. 11 (1918).—Scales of the fruiting ament firm and subcoriaceous, 5–8 mm. long; the cuneate basal portion 1–2.5 mm. long.—Cape Breton Island and Gaspé Co., Quebec to Ontario, south to the mountains of North Carolina, West Virginia, Illinois and Iowa.¹

Var. **macrolepis**, n. var., squamis subfoliaceis maturitate 8–13 mm. longis, parte pedali elongata 2.5–6 mm. longa. *B. lutea* Britton, No. Am. Trees, 258, fig. 217 (1908).—New Brunswick to Wisconsin, south to Tennessee, Indiana and Illinois. The following are characteristic. NEW BRUNSWICK: swamps, Campbellton, July, 1877, *R. Chalmers*. NOVA SCOTIA: Comeauville, August, 1900, *L. L. Dame*; mixed woods, Argyle, August 4, 1920, *Long & Linder*, no. 21,001; wooded roadside, Armdale (Dutch Village), July 28, 1921, *Fernald, Bartram & Long*, no. 23,766. MAINE: rocky woods, Dover, August 5, 1895, *Fernald*, no. 383; woods, High Head, Mount Desert Island, June 15, 1889, *Rand*; South Poland, 1893, *Kate Furbish*. NEW HAMPSHIRE: Randolph, August 17, 1902, *Pease*, no. 440; Breezy Point, Warren, July 23, 1908, *E. F. Williams*; woods, Dublin, July 23, 1897, *B. L. Robinson*, no. 266 (TYPE in Gray Herb.). VERMONT: Windham, July 9, 1904, *W. H. Blanchard*, no. 11. MASSACHUSETTS: Beverly, *Asa Gray*; Needham, December 9, 1883, *T. O. Fuller*; border of *Chamaecyparis* swamp, Hanson, October 29, 1916, *Fernald*, no. 15,128; Granville, September 20, 1913, *F. C. Seymour*, no. 34; Kitchen Brook, Cheshire, July 27, 1916, *J. R. Churchill*. RHODE ISLAND: Johnston, *S. T. Olney*; border of low woods, Tiverton, June 11, 1912, *S. N. F. Sanford*. CONNECTICUT: woods about Keney Park, Hartford, September 8, 1907, *A. W. Driggs*; woods, Southington, August

¹ Without fruiting material it is impossible to determine the exact identity of the Yellow Birch of Newfoundland, Labrador, and some regions to the south of the limits here given.

27, 1894, *Bissell*, no. 538; Mount Carmel, 1857, *D. C. Eaton*. NEW YORK: sandy woodlands, Whitestown, Oneida Co., September 2, 1904, *Haberer*, no. 808; border of sphagnum bog, southeast of Oriskany, July 2, 1904, *Haberer*, no. 809; moist rocky bank, Lower Enfield Ravine, Ithaca, September 5, 1915, *A. J. Eames*, no. 3922. WEST VIRGINIA: along East Fork of Greenbrier River, Pocohontas Co., September 19, 1904, *A. H. Moore*, no. 2364. TENNESSEE: lower slopes of the mountains, Doe River Valley, September, 1884. *John Ball*; near foot of Thunderhead Mt., July 25, 1896, *Ruth*, no. 474. INDIANA: tamarack and huckleberry marsh 6 miles north of Plymouth, August 31, 1914, *C. C. Deam*, no. 15,105; low border of Graveyard Lake, Steuben Co., June 11, 1911, *Deam*, nos. 8648, 8651 8653; wet woods about 12 miles east of Michigan City, June 17, 1911, *Deam*, no. 8760. WISCONSIN: Kilbourn, 1861, *T. J. Hale*; swamp, Preble, Brown Co., August 26, 1892, *J. H. Schuette*. ILLINOIS: Dixon, *Geo. Vasey*.

***BETULA CAERULEA-GRANDIS* Blanchard, *Betula*, i. no. 1 (May 7, 1904). *B. caerulea*, var. *grandis* Blanchard in Vermont Phoenix for May 13, 1904 and *Betula*, i. no. 2 (May 13, 1904). *B. caerulea*, var. *Blanchardi* Sargent, *Man. Trees N. A.* 202, fig. 168 A (1905).—A characteristic tree in portions of Nova Scotia; probably of wide distribution. HALIFAX Co.: wooded roadside, Armdale (Dutch Village). LUNENBURG Co.: roadside thickets and banks of Lahave River, Bridgewater.

B. caerulea-grandis is an abundant and characteristic tree in some parts of Prince Edward Island, especially in the forests of Queens County where, in the outskirts of Charlottetown and in the dry woods along Brackley Point Road, it forms very extensive groves with the stature and bark of *B. papyrifera* but at once recognized by the highly lustrous blue-green upper surfaces of the leaves. Upon examination these are found to be quite glabrous as are the young branchlets. The fruiting aments strongly resemble those of *B. papyrifera*. *B. caerulea-grandis*, besides occurring as a characteristic tree on Prince Edward Island and in Nova Scotia, is found thence to the Gaspé Peninsula and the region of Quebec, and south to eastern and central Maine, northern New Hampshire and the Green Mountains of Vermont. It is the tree of eastern America, incorrectly called by me¹ in earlier publications *B. pendula* Roth and *B. pendula* var. *japonica* Rehder. Besides Blanchard's Vermont material and the Nova Scotia collections above cited the following are characteristic.

QUEBEC: vicinity of Montmorenci Falls, July 7, 1905, *J. Macoun*, no. 68,774. PRINCE EDWARD ISLAND: dry woods, Brackley Point

¹ Fernald, *Am. Journ. Sci.* ser. 4, xiv. 184, 191 (1902): Robinson & Fernald in *Gray. Man.* ed. 7: 335 (1908).

Road, August, 1 1912, *Fernald, Long & St. John*, nos. 7299, 7300. MAINE: in disintegrated volcanic rock, Haystack Mountain, Aroostook Co., July 11, 1902, *Williams, Collins & Fernald*; shore of Rowe Pond, Pleasant Ridge, Somerset Co., September 10, 1909, *J. F. Collins*; near summit of hill with coast-survey tower, Cutler, July 7, 1902, *Kennedy, Williams, Collins & Fernald*; Sprague's Neck, Cutler, August 11, 1902, *Kate Furbish*. NEW HAMPSHIRE: Endicott Farm, Shelburne, July 4, 1914, *W. Deane*; roadside, Randolph, August 28, 1914, *Pease*, no. 16,298; near Glen House, Pinkham Notch, July 28, 1921, *T. W. Edmonson*, no. 5321.

When he first published *Betula caerulea-grandis* (May 7, 1904) Blanchard also put forward *B. caerulea*, introducing the two with the phrase: "The writer has found and here names and describes two new species of white birch." This first number of *Betula* was received at the Gray Herbarium on May 10, 1904. Almost immediately (on May 13) Blanchard issued in the *Vermont Phoenix* a popular account of his discoveries and reprinted this account "without change of type" as *Betula*, i. no. 2. In this second account he says "The blue birch, as I have said, presents two well-marked forms As these birches are without names I propose to call the smaller one ***Betula caerulea*** and the larger one ***Betula caerulea*** variety ***grandis***." This paper was received at the Gray Herbarium May 24 but, that Blanchard himself did not believe the larger-fruited tree to be really a variety of *B. caerulea*, is indicated by his annotations on the two copies sent, and on additional copies sent at the same time of *Betula*, no. 1. On the two copies of no. 2, in which *B. caerulea*, var. *grandis* was published as a variety, Blanchard had written in red ink; "Wise editor helped spoil" and "Spoiled by wise editor," while on the copies of no. 1 sent at the same time he wrote against the phrase "two new species;" "I stand by this" and "By this I stand now." It is thus clear that, although on *second thought* Blanchard wavered, on *third thought* he regarded the two as species as he had originally done. The name *B. caerulea*, var. *Blanchardi* (1905), based upon the same material as *B. caerulea-grandis* (1904) and *B. caerulea*, var. *grandis* (1904), must be treated as a synonym.

**BETULA CAERULEA Blanchard, *Betula*, i. no. 1 (May 7, 1904); Sargent, *Man. Trees* N. A. 201, fig. 168 (1905). HALIFAX Co.: dry rocky thickets. Dartmouth; wooded roadside, Armdale (Dutch Village).

At the latter station *B. caerulea* was associated with the abundant *B. caerulea-grandis* and *B. populifolia*; at Dartmouth, only a few miles away, it was with at least *B. populifolia*; and at its Vermont

stations it occurs with *B. caerulea-grandis* and *B. populifolia*. In foliage *B. caerulea* is a good combination of the two; in fruiting aments it is much closer to *B. populifolia*, having short horizontally divergent and puberulent scales, and in a large proportion of specimens there is only a solitary staminate ament, *B. caerulea-grandis* more often having 2 or 3. The present evidence seems to indicate that *B. caerulea* is a hybrid of *B. caerulea-grandis* and *B. populifolia* and it is noteworthy that on one of his sheets of *B. caerulea* in the Gray Herbarium Blanchard originally wrote: "It may be a hybrid between *pendula* [of eastern America, i. e. *B. caerulea-grandis*] and *populifolia*."

ALNUS INCANA (L.) Moench, var. HYPOCHLORA Call. Recorded from a single station in RHODORA, xxiii. 257 (1922). Frequent eastward at least to Lunenburg Co.

QUERCUS BOREALIS Michx. f., var. MAXIMA (Marsh.) Ashe, Proc. Soc. Am. Foresters, xi. 90 (1916). *Q. rubra* of authors, not L. Although the common oak of Nova Scotia is typical *Q. borealis* (*Q. rubra*, var. *ambigua*), the southern extreme with flattish cups was twice collected. YARMOUTH Co.: dry woods near Canoe Lake. ANNAPOLIS Co.: woods bordering Boot Lake.

***Polygonum Bistorta* L. Sp. Pl. i. 360 (1753). The European Bistort is somewhat naturalized (at least two obviously increasing clumps) in a field in Victoria Park, Truro.

P. MUHLENBERGII (Meisn.) Watson. Additional stations are, in YARMOUTH Co.: cobbly beach of Ogden Lake; rocky swale bordering Dominick Lake east of Springhaven.

*P. PENSYLVANICUM L., var. GENUINUM Fernald, RHODORA, xix. 72 (1917). ANNAPOLIS Co.: exsiccated clay roadway bordering salt marsh, Annapolis Royal; first record from east of Massachusetts, previous records belonging to var. LAEVIGATUM Fernald.

P. ROBUSTIUS (Small) Fernald, RHODORA, xxiii. 147 (1921). Additional stations, in YARMOUTH Co.: cobbly beach of Ogden Lake. DIGBY Co.: rocky thicket bordering West Branch of Tusket R., Havelock; rocky thicket bordering Wentworth Lake. ANNAPOLIS Co.: in peat and granite gravel bordering outlet of Lamb's Lake.

**P. PURITANORUM Fernald, RHODORA, xxi. 141 (1919). ANNAPOLIS Co.: in sand or gravel among granite boulders, beach of Grand Lake; first record outside southeastern Massachusetts.

P. HYDROPIPEROIDES Michx. Common eastward at least to Annapolis and Lunenburg Cos.

P. HYDROPIPEROIDES, var. DIGITATUM Fernald, RHODORA, xxiii. 260 (1922). Typical *P. hydropiperoides* was in maturity from mid-July through August, but the original colony of var. *digitatum*, when visited on August 23, barely showed color in the inflorescences: the original collection was made (in good flower) in October, 1920.

**P. *hydropiperoides* × *robustus*, n. hybr., caule decumbente

basi valde lignescenti stoloniferoque plerumque 3-5 mm. crasso; ramis floriferis adscendentibus 0.3-1 m. longis; foliis anguste ellipticis vel elliptico-lanceolatis acuminatis vel acutis 0.5-2 dm. longis 0.8-4 cm. latis; ocreis laxe cylindricis strigosis ciliatis, ciliis 2-5 mm. longis; pedunculis erectis elongatis; spicis filiformibus plerumque 0.4-1 dm. longis alternifloris, rhachi purpurascens; ocreolis ciliatis: perianthiis lacteis 2-3 mm. longis, epunctatis vel rare punctatis: achaeniis vacuis.

NOVA SCOTIA: in great abundance in peat and granite gravel bordering outlet of Lamb's Lake, Annapolis Co. July 19, 1921 (foliage), *Fernald, Bartram, Long & Fassett*, no. 23,802, August 29, *Fernald & Long*, no. 23,803 (TYPE in Gray Herb.) and in *Pl. Exsicc. Gray.*, September 16, *Donald McPherson*, no. 23,804.

Exactly combining the aspect and characters of the two species, both of which occur with or near it. In its coarse habit with stout subligneous base nearer *P. robustius*; in foliage intermediate; in the spike showing the slender habit of *P. hydropiperoides* and the purple color of the rhachis, but in the large milk-white flowers and the great length of the spikes suggesting *P. robustius*. Practically all the achenes are empty. Out of 135 sheets of specimens collected on August 29 we were able to secure only 5 partially filled achenes; while a mass of 100 or more older inflorescences collected in September by Mr. McPherson yielded no good achenes.

Chenopodium Bonus-Henricus L. ANNAPOLIS Co.: locally abundant, roadsides and waste ground, Annapolis Royal.

BRASENIA SCHREBERI Gmel. Lakes of Shelburne Co.

CORYDALIS SEMPERVIRENS (L.) Pers. Apparently rare. Seen only in recently cleared land in Digby Co. (Wentworth Lake) and Lunenburg Co. (Bridgewater).

SUBULARIA AQUATICA L. Many additional stations in Digby and Lunenburg Cos.

SARRACENIA PURPUREA L., forma **heterophylla** (Eaton), n. comb. *S. heterophylla* Eaton, Man. ed. 4: 445 (1824). *S. purpurea*, var. *heterophylla* (Eaton) Torr. Rep. Bot. Dept. Surv. N. Y. Assembly No. 50: 120 (1839), Fl. N. Y. i. 41 (1843). *S. purpurea heterophylla* (Eaton) Britton, Mem. Torr. Bot. Cl. v. 176 (1894).

This very striking color-form, with yellow-green sepals, yellowish petals and stigma and pale-green leaves, occurs abundantly at the boggy margin of Young's Lake, North Mt., Belle Isle (Annapolis Co.).

PYRUS ARBUTIFOLIA (L.) L. f. SHELBURNE Co.: wet thicket bordering Harper Lake.

AMELANCHIER STOLONIFERA Wiegand. Additional stations in Yarmouth Co.

A. STOLONIFERA, var. LUCIDA Fernald, RHODORA, xxiii. 267 (1922). Additional stations in Yarmouth, Shelburne and Lunenburg Cos.

A. LAEVIS Willd., var. NITIDA (Wiegand) Fernald, RHODORA, xxiii. 267 (1922). Many stations from Yarmouth Co. to Halifax Co.

*POTENTILLA PUMILA Poir. LUNENBURG Co.: abundant in dry open soil and at borders of pine woods about Bridgewater; first east of the lower Penobscot. Previously known in Canada only from southern Ontario.—J. M. Macoun, Ott. Nat. xvi. 214 (1903).

**Filipendula rubra* (Hill) Robinson. Damp roadside-thicket, Yarmouth.

RUBUS ODORATUS L. var. **malachophyllus, n. var. foliis utrinque densissime pilosis vel subvelutinis supra juventate et subtus ad nervos atro-glandulosis.

Leaves densely pilose or almost velvety on both surfaces, the upper surfaces of the young and the nerves beneath black-glandular.—NOVA SCOTIA: thicket, Belleville, Yarmouth Co., July 23, 1921, Fernald, Bartram & Long, no. 23,974 (TYPE in Gray Herb.).

Typical *Rubus odoratus* has the leaves nearly or often quite glabrous on the upper surfaces and only sparingly pubescent on the nerves beneath, and only rarely in the typical continental plant do glands occur upon the leaf-surfaces. Lindsay records *R. odoratus* as "cult'ed at Annap[oli]s., pos'bly fm. w[ild] plants."

***R. illecebrosus* Focke, Abh. Nat. Ver. Bremen, xvi. 278 (1899).—An ornamental garden plant from Japan, tending to spread from cultivation at Annapolis Royal.

R. ALLEGHENIENSIS Porter. Much of the Nova Scotia shrub is uncharacteristic, having comparatively short and leafy-bracted racemes, and subglobose berries with coarse drupelets of inferior flavor. This may prove to be separable from *R. allegheniensis*.

R. GLANDICAULIS Blanchard. The typical form of the species collected in HANTS Co.: gravelly thicket near Uniacke Lake.

R. AMNICOLA Blanchard. YARMOUTH Co.: thickets and clearings bordering savannah along South Branch of Tusket River, Quinan; high-arching shrubs, very prolific, bearing fruit of the richest quality. Should be cultivated.

R. MULTIFORMIS Blanchard. Many additional stations, especially in Shelburne Co., where this low-arching or trailing species is characteristic of boggy thickets and river- and lake-margins.

R. BIFORMISPINUS Blanchard. One of the most characteristic coarse trailers of the sandy roadsides and railroad embankments in southern Yarmouth and Shelburne Cos. The lustrous foliage of darkest green is very handsome and the stout sprawling canes are often nearly 1 cm. in diameter; fruit inferior.

R. RECURVANS Blanchard. Frequent from Yarmouth Co. to Lunenburg Co. Where well developed, as about Gavelton or in thickets by Ogden Lake, furnishing the choicest blackberries in the province.

R. RECURVICAULIS Blanchard. The observations of 1920 were confirmed: that this is one of the commonest species of rocky or gravelly habitats.

R. VERMONTANUS Blanchard. Additional stations in Annapolis and Shelburne Cos.

R. TARDATUS Blanchard. Additional stations in Yarmouth, Shelburne and Hants Cos.

R. ABBREVIANS Blanchard. Frequent in Yarmouth and Shelburne Cos. Additional stations in YARMOUTH Co.: sphagnous thicket, Markland (Cape Forchu), nos. 23,982, 24,025; gravelly railroad bank, Tusket, no. 23,996; open rocky thicket near Vaughan (Tusket) Lake, Gavelton, no. 24,016. SHELBURNE Co.: gravelly railroad bank, Atwood Brook, no. 23,987; rocky thicket bordering Welshtown (Birchtown) Lake, no. 24,003.

R. ARCUANS Fernald & St. John. Very luxuriant on the gravelly railroad banks from Shelburne to Sable River.

R. JACENS Blanchard. Additional stations northward to Digby Neck and eastward to Lunenburg Co.

***ROSA NITIDA* × *PALUSTRIS* Rydb. N. A. Fl. xxii. 496 (1918). *R. carolina* × *nitida* Crépin, RHODORA, ii. 113 (1900). *R. carolina*, var. *setigera* Crepin, l. c. A characteristic clump in wet rocky thicket bordering Sparrel Lake, southeast of Hasset, Digby Co.

**R. NITIDA* × *VIRGINIANA* Rydb. l. c. 502 (1918). Border of spruce swamp, Markland (Cape Forchu).

***R. OBOVATA* Raf. as interpreted by Rydberg l. c. 499 (1918). Apparently a well defined species. Our material is from YARMOUTH Co.: damp thicket bordering Brazil Lake. LUNENBURG Co.: borders of dry pine and oak woods on steep slopes along Lahave River, Bridgewater (quite like the southern specimens).

Cytisus scoparius (L.) Link. Long known from Shelburne; but now rapidly covering all open ground of roadside, pasture and woods-border along the main road from Shelburne to Jordon Falls, especially in the vicinity of Swanburg Lake. The plant is locally gathered for the drug market.

Trifolium dubium Sibth. Northeastward to Weymouth.

**Vicia sepium* L. Border of field, Annapolis Royal.

APIOS TUBEROSA Moench. Many additional stations in Digby, Annapolis and Lunenburg Cos. In 1920 the plant appeared always sterile, in 1921 it flowered heavily.

GERANIUM BICKNELLII Britton. Seen only in a recently burned clearing west of Bridgewater—one of the most characteristic habitats of the plant elsewhere. Earlier records of *G. carolinianum* undoubtedly belong here.

ILEX VERTICILLATA (L.) Gray, var. *TENUIFOLIA* (Torr.) Wats. SHELBURNE Co.: rocky shore of Deception Lake.

I. VERTICILLATA, var. *FASTIGIATA* (Bicknell) Fernald, RHODORA, xxiii. 274 (1922). Additional stations in Yarmouth and Shelburne Cos.

ACER RUBRUM L., var. TRIDENS Wood. HALIFAX Co.: mixed woods, Armdale (Dutch Village).

**A. Negundo* L. Well naturalized on banks of Lahave River. Bridgewater.

Vitis labrusca × *vinifera*. A single vigorous vine of one of the commonly cultivated grapes is growing in the gravelly thicket at the foot of a railroad bank near Uniacke Lake; obviously sprung from seed thrown from the train.

HYPERICUM DISSIMULATUM Bicknell. Additional stations in Digby, Yarmouth and Lunenburg Cos.

ELATINE MINIMA (Nutt.) Fisch. & Meyer. Many additional stations in Annapolis, Lunenburg and Hants Cos.

HUDSONIA ERICOIDES L. SHELBURNE Co.: dry rocky and sandy barrens, Shelburne.

VIOLA LABRADORICA Schrank. The Nova Scotia material passing as *V. conspersa* has the very small and nearly entire stipules of *V. labradorica*. In foliage it is sometimes quite like the latter, at other times like the former and its exact identification must await better material.

Daphne Mezereum L. Thoroughly naturalized and very handsome in roadside-thickets and on clay banks in the gypsiferous or basaltic regions from Annapolis Co. to Hants Co.

Shepherdia canadensis (L.) Nutt. A single shrub, not yet destroyed, on an open bank near gypsum quarries, Windsor.

DECODON VERTICILLATUS (L.) Ell., var. LAEVIGATUS T. & G. Additional stations, for DIGBY Co.: among granite boulders bordering Cedar Lake, New Tusket. SHELBURNE Co.: quaking sphagnous border of Western Lake, Birchtown Brook; peaty margin of McKay's Lake, Middle Ohio.

RHEXIA VIRGINICA L. Additional stations, for YARMOUTH Co.: peaty and cobbly beach of St. John (Wilson's) Lake; very abundant, peaty swale bordering Canoe Lake. SHELBURNE Co.: upper border of cobbly beach, Welshtown (Birchtown) Lake; upper border of cobbly beach, McKay's Lake, Middle Ohio. LUNENBURG Co.: upper border of gravelly beach, Feindel's Lake, west of Bridgewater.

*EPILOBIUM COLORATUM Muhl. Open spot with both native and introduced plants near railroad station, Weymouth. Should be sought in more natural habitats. First east of the Penobscot region, the earlier records from eastern Canada resting on *E. glandulosum* vars. *adenocaulon* (Haussk.) Fernald and *occidentale* (Trel.) Fernald.

OENOTHERA HYBRIDA Michx. Fl. Bor.-Am. i. 225 (1803); Blake, RHODORA, xx. 51 (1918). *O. fruticosa*, var. *hirsuta* Nutt. in T. & G. Fl. i. 496 (1840). *Kneiffia tetragona hybrida* (Michx.) Pennell, Bull. Torr. Bot. Cl. xlv. 371 (1919).—DIGBY Co.: dry sandy open soil of pastures and roadsides, Ashmore. Doubtless this is the plant reported by others from western Nova Scotia as *O. fruticosa*.

Dr. F. W. Pennell objects to the use of the perfectly identified and

typified name *O. hybrida* Michx. because, in taking up this earliest valid specific name, "Dr. Blake has hardly improved nomenclature—surely not in the opinion of our genetical friends—by the substitution of the name '*hybrida*.'" Under the generic name *Oenothera* this specific name is, naturally, unfortunate but "No one is authorized to reject, change or modify a name (or combination of names) because it is badly chosen," etc. (Internat. Rules, Art. 50) and under the generic name *Kneiffia*, which Pennell maintains, it could not be very embarrassing to "our genetical friends," since they have not specially concerned themselves with that subgenus (or genus). As a result of his objection to the name *Oenothera hybrida* Michx. Pennell made a special search of literature in "the hope of finding for this species some appropriate name." This he feels that he has found in *O. tetragona* Roth, *Catalecta*, ii. 39 (1800), a name which antedates by three years Michaux's publication. Pennell has seen no specimen but is satisfied that "the full description would apply to the plant here considered." Whether Roth had a plant which is conspecific with *O. hybrida* Michx. (the *Kneiffia fruticosa* of the Illustrated Flora) is certainly very doubtful. Roth calls for a plant with dichotomus branching (Caulis . . . dichotomus), a habit not shown in any material I have seen; Roth calls for oval, obtuse, entire, recurved leaves about 3 inches long and 1 inch wide (Folia . . . ovalia, obtusa, integra, . . . plerumque recurva, tres uncias circiter longa unciamque in medio lata), but the Illustrated Flora correctly describes our plant with "Leaves lanceolate, ovate-lanceolate or oval-lanceolate, acute or obtusish . . . repand-denticulate, or rarely nearly entire," while Pennell's key-characters describe his *K. tetragona* with "Leaves lanceolate." Roth knew perfectly well that his *O. tetragona* did not have lanceolate and repand leaves, for in contrasting it with *O. tetraptera* Cav. he said: "*Foliis ovalibus, integris; nec lanceolatis, a basi ad medium vsque pinnati fidis.*" Similarly in distinguishing it from *O. fruticosa* he said: "*Foliis ovalibus, obtusis; nec lanceolatis, acutis.*" And surely the spreading-ascending leaves of *O. hybrida* are not well described as "recurva." The calyx-tube of *O. hybrida* is very slender, well described as filiform, but Roth described the calyx-tube of *O. tetragona* as cylindric (cylindraceus . . . crassitie pedicelli) and emphasized its thickness by contrasting it with that of *O. fruticosa*: "*Calycis tubo cylindraceo; nec filiformi, angustissimo.*" Other points, such as the crenate petals

described by Roth, might be discussed, but enough has already been emphasized to indicate that Roth's detailed description of *O. tetragona* departs in very many points from *O. hybrida* and that those who wish to throw out Michaux's specific name must find an earlier name which is more clearly synonymous with it than is *O. tetragona* Roth.

MYRIOPHYLLUM HUMILE (Raf.) Morong. YARMOUTH Co.: Vaughan (Tusket) Lake. LUNENBURG Co.: Feindel's Lake, west of Bridgewater; Rhodeniser Lake. HANTS Co.: Uniacke Lake.

M. TENELLUM Bigel. The tremendous variation in the stature of this species is illustrated by our collections. At the gravelly margin of Uniacke Lake (Hants) the plant was flowering when 2.5–5 cm. high; but in a peaty cove of Little Meteghan Lake the coarse stems reached a height of 5.5 dm.

PROSERPINACA PALUSTRIS L. At various stations from Yarmouth Co. to Annapolis and Lunenburg Cos.: in the latter region sometimes reaching remarkable development: 0.5 m. high, with emerged leaves up to 8.5 cm. long and 1.3 cm. broad.

P. PECTINATA Lam. Additional stations, for YARMOUTH Co: wet savannahs bordering Goven and Kegeshook Lakes and South Branch by Tusket River, Quinan. LUNENBURG Co.: sphagnous swale west of Italy Cross; sandy and gravelly beach of Blystner Lake; peaty bottom of dried-out mill-pond north of Blockhouse.

**HYDROCOTYLE UMBELLATA L. YARMOUTH Co.: wet sandy and gravelly margin of St. John (Wilson's) Lake; first time east of Massachusetts. Very rare and local and appearing like a waif washed down from some as yet undiscovered station farther up the valley of the Tusket.

H. AMERICANA L. Frequent eastward at least to Annapolis and Lunenburg Cos.

**Aethusa Cynapium* L. Waste ground in barn-yard, Shelburne.

CORNUS STOLONIFERA Michx. Westward to Annapolis Co.

PYROLA CHLORANTHA Sw. At various stations in Digby, Annapolis and Hants Cos. Var. *paucifolia* Fernald seems hardly worth maintaining.

P. ROTUNDIFOLIA L., var. ARENARIA Mert. & Koch. Additional stations eastward to Hants Co.

*VACCINIUM CORYMBOSUM L. The typical form of the species we have only from thickets bordering Goven Lake, Yarmouth Co.

V. CORYMBOSUM, var. AMOENUM (Ait.) Gray. Additional stations eastward to the Roseway River, Shelburne Co.

V. CORYMBOSUM, var. PALLIDUM (Ait.) Gray. Additional stations eastward to Welchtown (Birchtown) Lake, Shelburne Co.

PRIMULA FARINOSA L., var. MACROPODA Fernald. YARMOUTH Co.: turf crests and slopes of exposed headlands, Markland (Cape Forchu); reported to us from headlands near Pembroke Shore.

SAMOLUS FLORIBUNDUS HBK. SHELBURNE Co.: border of salt

marsh, Port Clyde. LUNENBURG Co.: brackish mud by Lahave River, Bridgewater.

LYSIMACHIA TERRESTRIS (L.) BSP. In boggy thickets reaching a full meter in height; in dry sands fruiting at a height of 2 dm.

SABATIA KENNEDYANA Fernald. Many additional stations, all in the Tusket Valley, eastward to Canoe Lake.

**S. KENNEDYANA, forma CANDIDA Fernald, RHODORA, xviii. 151 (1916). The albino-flowered form local by Vagahan (Tusket) and Canoe Lake.

S. KENNEDYANA, forma **eucycla, n. f., lobis corollae late obovatis plus minusve imbricatis.

Lobes of the corolla broadly obovate, more or less imbricated.—NOVA SCOTIA: wet peaty margin of Vaughan (Tusket) Lake, Gavelton, Yarmouth Co., August 13, 1921, *Fernald & Long*, no. 24,354 (TYPE in Gray Herb.).

The ordinary form of *S. Kennedyana* has the segments narrowly cuneate-obovate, averaging two-fifths as broad as long, and with only rarely overlapping margins. Forma *eucycla*, with the lobes five-sevenths as broad as long and with usually overlapping margins, forms a colony of considerable extent at one point on Vaughan Lake.

BARTONIA VIRGINICA (L.) BSP. Many additional stations in Yarmouth and Shelburne Cos. Plants from *Corema*-barrens north of Jordon Falls have very large flowers, with calyx up to 4.5 mm. long.

B. PANICULATA (Michx.) Robinson. Many additional stations in Digby, Yarmouth, Shelburne, Lunenburg and Halifax Cos.

B. PANICULATA, var. INTERMEDIA Fernald, RHODORA, xxiii. 287 (1922). Many additional stations in Yarmouth, Shelburne and Lunenburg Cos.

B. PANICULATA, var. SABULONENSIS Fernald, l. c. 288 (1922). Colonies closely approaching the Sable Island plant in SHELBURNE Co.: wet sandy beach, Harper Lake. LUNENBURG Co.: peaty and gravelly beach of Feindel's Lake, west of Bridgewater.

APOCYNUM CANNABINUM L. LUNENBURG Co.: cobbly beach of Wentzell Lake.

ASCLEPIAS INCARNATA L., var. PULCHRA (Ehrh.) Pers. DIGBY Co.: rocky thicket bordering Wentworth Lake. YARMOUTH Co.: thicket at upper border of cobbly beach, Parr Lake. LUNENBURG Co.: peaty margin of a dried-out mill-pond north of Blockhouse.

The only other Canadian records are from New Germany, Lunenburg Co.—J. M. Macoun, Ott. Nat. xv. 77 (1901).

(To be continued.)